

**WHAT IS CLAIMED IS:**

1. A reshaping hair styling composition comprising, in a cosmetic vehicle appropriate for hair, at least one polyurethane, wherein said composition provides a reshaping effect.

5 2. A reshaping hair styling composition comprising, in a cosmetic vehicle appropriate for hair, at least one dispersion comprising at least one polyurethane in a water and/or solvent medium, said at least one polyurethane being obtained by reacting:

10 (a) an isocyanate terminated polyurethane prepolymer being obtained by reacting: (i) at least one polyactive hydrogen compound insoluble in the medium of the dispersion, wherein said polyactive hydrogen compound is chosen from alkyl, aryl, and aralkyl structures optionally substituted in and/or on the structure by N, O, and/or S groups; (ii) at least one polyisocyanate, and (iii) at least one polyactive hydrogen compound soluble in the medium of the dispersion,

15 (b) at least one polyfunctional chain extender; and

(c) at least one chain terminator,

wherein said composition provides a reshaping effect.

3. The composition according to claim 2, further comprising at least one additional polymer.

20 4. The composition according to claim 3, wherein said at least one additional polymer is chosen from anionic, cationic, amphoteric, nonionic, and zwitterionic polymers.

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5. The composition according to claim 2, wherein said medium of the dispersion is at least one compound chosen from water and alcohols.
6. The composition according to claim 5, wherein said alcohols are chosen from lower alcohols.
- 5 7. The composition according to claim 2, wherein said at least one medium insoluble polyactive hydrogen compound is chosen from oligomeric polyols and oligomeric polyamines having on average from about 1.6 to about 4 hydroxyl or amino groups.
- 10 8. The composition according to claim 2, wherein said at least one medium insoluble polyactive hydrogen compound is chosen from polybutadiene polyols, polyisoprene polyols, hydrogenated polybutadiene polyols, hydrogenated polyisoprene polyols, polyester polyols from dimer diacids, polyester polyols from dimer diols, and dimer diols.
- 15 9. The composition according to claim 2, wherein said prepolymer is obtained by reacting: (i) at least one polyactive hydrogen compound insoluble in the medium of the dispersion, wherein said polyactive hydrogen compound is chosen from alkyl, aryl, and aralkyl structures optionally substituted in and/or on the structure by N, O, and/or S groups; (ii) at least one polyisocyanate, (iii) at least one polyactive hydrogen compound soluble in the medium of the dispersion, and (iv) at least one monomeric polyactive hydrogen compound soluble in the medium of the dispersion chosen from C36 dimer fatty alcohols, ethylene glycol, propylene glycol, butylene glycol, hexamethylene glycol, diethylene glycol, 1,1,1-trimethylolpropane,
- 20

pentaerythritol, and aminoethanol.

10. The composition according to claim 2, wherein said at least one polyisocyanate is chosen from aliphatic polyisocyanates and cycloaliphatic polyisocyanates.

5           11. The composition according to claim 2, wherein said at least one polyisocyanate is chosen from dicyclohexylmethane 4,4'-diisocyanate, 3,5,5-trimethyl-1-isocyanato-3-isocyanatomethylcyclohexane, tetramethylene diisocyanate, 1,3-bis(isocyanatomethyl)cyclohexane, 1,3-bis(1-isocyanato-1-methylethyl)benzene, diphenylmethane 4,4'-diisocyanate, 4,4',4"-triisocyanatotriphenylmethane, polymethylene polyphenylene polyisocyanate, toluene diisocyanate, hexamethylene diisocyanate, dodecamethylene diisocyanate, and *m*- and *p*-xylene diisocyanate.

10           12. The composition according to claim 2, wherein said at least one medium soluble polyactive hydrogen compound is chosen from (i) compounds comprising at least one ionic group, (ii) compounds comprising at least one moiety capable of forming an ionic group, and (iii) compounds comprising at least one group chosen from polyester, polyether, and polycarbonate groups having a ratio of 5:1 or less carbon atoms to each oxygen atom.

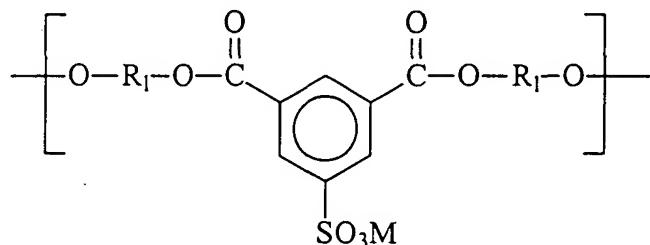
15           13. The composition of claim 12, wherein said at least one medium soluble polyactive hydrogen compound is chosen from cationic compounds having the following structure:



20           wherein R is chosen from C<sub>1</sub>-C<sub>18</sub> alkyl, C<sub>6</sub>-C<sub>18</sub> aryl, and C<sub>6</sub>-C<sub>18</sub> aralkyl structure optionally

substituted in and/or on the structure by N, O, and/or S groups; R<sub>2</sub> is chosen from a hydrogen atom and C<sub>1</sub>-C<sub>18</sub> alkyl groups; n is an integer from about 1 to about 200; and X<sup>-</sup> is chosen from halides, sulfates, methosulfates, ethosulfates, acetates, carbonates, and phosphates.

- 5        14. The composition of claim 12, wherein said at least one medium soluble polyactive hydrogen compound is chosen from compounds having the following structure:



wherein each R<sub>1</sub> is the same or different and chosen from divalent aliphatic groups having an average molecular weight of about 200 to about 600 comprising ether and/or ester functional groups chosen from:

- CH<sub>2</sub>-CH<sub>2</sub>-(OCH<sub>2</sub>-CH<sub>2</sub>-)<sub>n</sub>- ,
- C(CH<sub>3</sub>)H-CH<sub>2</sub>-(OC(CH<sub>3</sub>)H-CH<sub>2</sub>-)<sub>n</sub>- ,
- (CH<sub>2</sub>)<sub>4</sub>-(O(CH<sub>2</sub>)<sub>4</sub>)<sub>n</sub>- , and
- (CH<sub>2</sub>)<sub>m</sub>-CO-[-O-(CH<sub>2</sub>)<sub>m</sub>-CO-]<sub>n</sub>- groups;

- 10      15. where m is an integer from about 2 to about 5 and n is an integer from about 2 to about 15.

15. The composition according to claim 2, wherein said prepolymer is obtained by reacting: (i) at least one polyactive hydrogen compound insoluble in the

medium of the dispersion, wherein said polyactive hydrogen compound is chosen from alkyl, aryl, and aralkyl structures optionally substituted in and/or on the structure by N, O, and/or S groups; (ii) at least one polyisocyanate, (iii) at least one polyactive hydrogen compound soluble in the medium of the dispersion, and (iv) at least one monofunctional cationic stabilizer.

16. The composition according to claim 2, wherein said at least one polyfunctional chain extender is chosen from water; ethylenediamine, 1,6-diaminohexane, piperazine, tris(2-aminoethyl)amine, amine terminated polyethers, adipic acid dihydrazide, oxalic acid dihydrazide, ethylene glycol, 1,4-butane diol, 1,8-octane diol, 1,2-ethanedithiol, 1,4-butanedithiol, 2,2'-oxytris(ethane thiol), di-mercaptopropionate esters of poly(oxyethylene) diols, di-mercaptopropionate esters of poly(oxyethylene) triols, tri-mercaptopropionate esters of poly(oxyethylene) diols, and tri-mercaptopropionate esters of poly(oxyethylene) triols.

17. The composition according to claim 2, wherein said at least one chain terminator is chosen from monofunctional chain terminators.

18. The composition according to claim 2, wherein said at least one polyfunctional chain extender is also the at least one chain terminator.

19. The composition according to claim 18, wherein said at least one polyfunctional chain extender is chosen from diamine.

20. The composition according to claim 2, wherein the equivalent ratio of said chain extender to said prepolymer isocyanate is from about 0.60:1 to about 1.20:1.

21. The composition according to claim 2, wherein said at least one

polyurethane dispersion has an ionic content of about 1000 to about 15000 gram of prepolymer per equivalent of an ionic group.

22. The composition according to claim 2, wherein said polyurethane reaction product has a weight average molecular weight of about 5000 to about 50000.

5 23. The composition according to claim 2, wherein the dispersion is a stable dispersion.

24. The composition according to claim 2, wherein the at least one polyurethane dispersion has a Tg ranging from about -100 to about 15°C.

10 25. The composition according to claim 2, further comprising at least one other constituent, which is conventional in cosmetics, chosen from preservatives, perfumes, UV filters, active haircare agents, plasticizers, anionic, cationic, amphoteric, nonionic, and zwitterionic surfactants, hair conditioning agents such as silicone fluids, fatty esters, fatty alcohol, long chain hydrocarbons, emollients, lubricants, and penetrants such as lanolin compounds, protein hydrolysates, and other protein derivatives, dyes, tints, bleaches, reducing agents, pH adjusting agents, sunscreens, preservatives, thickening agents, and perfumes.

15 26. An aerosol device comprising a vessel, which comprises (1) an aerosol composition, which comprises a liquid phase comprising at least one composition comprising at least one dispersion comprising at least one polyurethane in a water and/or solvent medium, said at least one polyurethane being obtained by reacting:

20 (a) an isocyanate terminated polyurethane prepolymer being obtained by reacting: (i) at least one polyactive hydrogen compound insoluble in the medium of the

dispersion, wherein said polyactive hydrogen compound is chosen from alkyl, aryl, and aralkyl structures optionally substituted in and/or on the structure by N, O, and/or S groups; (ii) at least one polyisocyanate, and (iii) at least one polyactive hydrogen compound soluble in the medium of the dispersion,

- (b) at least one polyfunctional chain extender; and
  - (c) at least one chain terminator,

wherein said composition provides a reshaping effect.

and a propellant, and (2) a dispenser.

27. A method of cosmetically treating hair, comprising the application of a

composition comprising at least one dispersion comprising at least one polyurethane in a water and/or solvent medium, said at least one polyurethane being obtained by reacting:

- (a) an isocyanate terminated polyurethane prepolymer being obtained by reacting: (i) at least one polyactive hydrogen compound insoluble in the medium of the dispersion, wherein said polyactive hydrogen compound is chosen from alkyl, aryl, and aralkyl structures optionally substituted in and/or on the structure by N, O, and/or S groups; (ii) at least one polyisocyanate, and (iii) at least one polyactive hydrogen compound soluble in the medium of the dispersion,

- (b) at least one polyfunctional chain extender; and
  - (c) at least one chain terminator.

wherein said composition provides a reshaping effect

to the hair before, during, or after the shaping of the hairstyle.

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28. A method of manufacturing a reshaping hair styling composition comprising the inclusion of at least one dispersion comprising at least one polyurethane in a water and/or solvent medium, said at least one polyurethane being obtained by reacting:

5 (a) an isocyanate terminated polyurethane prepolymer being obtained by reacting: (i) at least one polyactive hydrogen compound insoluble in the medium of the dispersion, wherein said polyactive hydrogen compound is chosen from alkyl, aryl, and aralkyl structures optionally substituted in and/or on the structure by N, O, and/or S groups; (ii) at least one polyisocyanate, and (iii) at least one polyactive hydrogen

10 compound soluble in the medium of the dispersion,

- (b) at least one polyfunctional chain extender; and  
(c) at least one chain terminator,

wherein said composition provides a reshaping effect.

15 29. A reshaping hair styling composition comprising, in a cosmetic vehicle appropriate for hair, at least one dispersion comprising at least one polyurethane, wherein said composition provides a reshaping effect.

30. A reshaping hair styling composition comprising, in a cosmetic vehicle appropriate for hair, at least one dispersion comprising at least one polyurethane in a water and/or solvent medium, wherein said composition provides a reshaping effect.

20 31. An aerosol device comprising a vessel, which comprises (1) an aerosol composition, which comprises a liquid phase comprising at least one composition comprising at least one polyurethane, wherein said composition provides a reshaping

effect, and a propellant, and (2) a dispensor.

32. A method of cosmetically treating hair, comprising the application of a composition comprising at least one polyurethane to the hair before, during, or after the shaping of the hairstyle, wherein said composition provides a reshaping effect.

5 33. A method of manufacturing a reshaping hair styling composition comprising the inclusion of at least one polyurethane, wherein said composition provides a reshaping effect.